

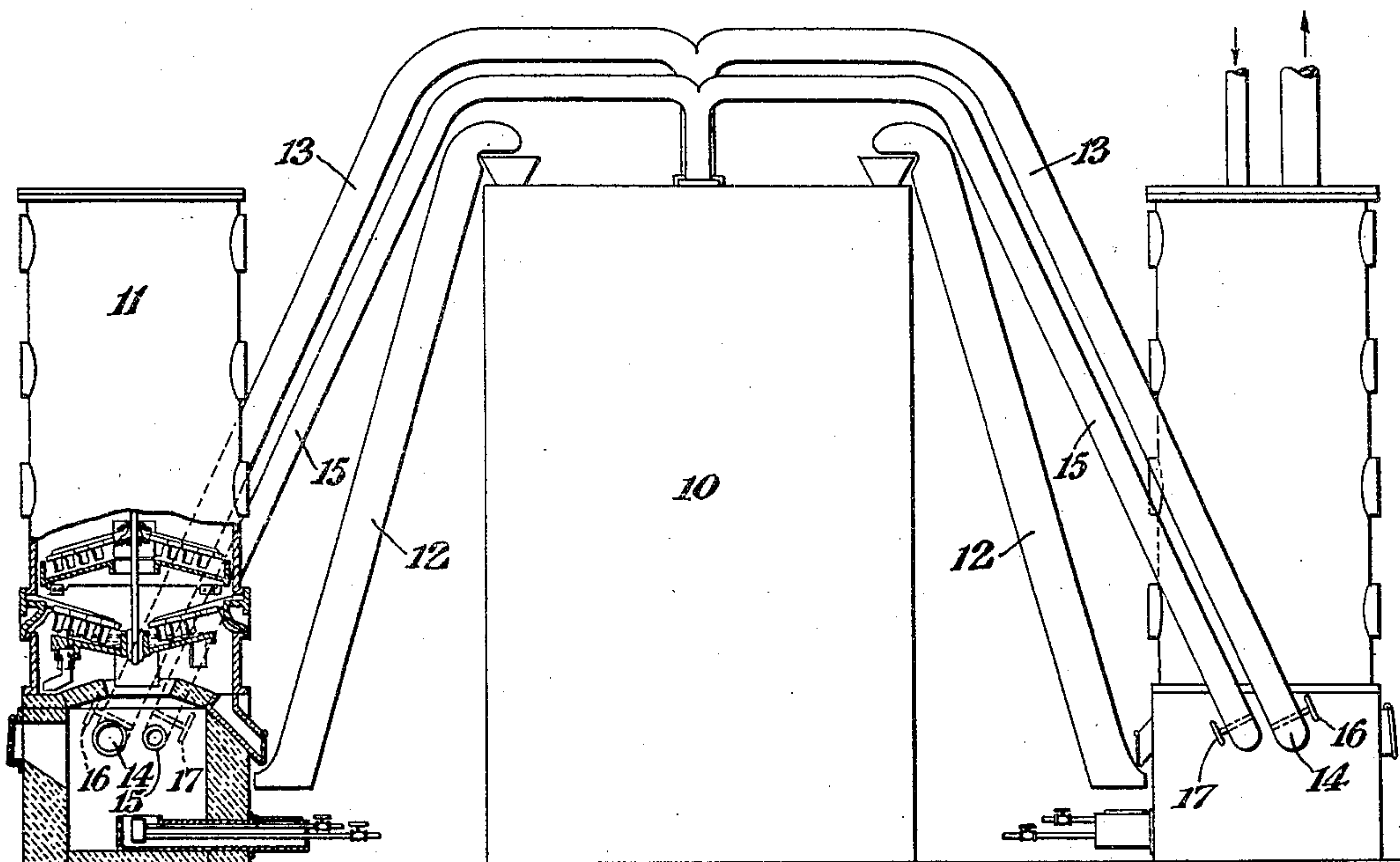
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FURNACE CONSTRUCTION

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FURNACE CONSTRUCTION

Original application filed March 8, 1928, Serial No. 260,033. Divided and this application filed December 30, 1931. Serial No. 583,912.

This invention relates to furnace constructions and arrangements adapted for various dewatering, drying and roasting operations and the objects of the invention include the provision of arrangements of this class which will be relatively simple and inexpensive in construction and highly efficient under various conditions of operation.

Various further and more specific objects, features and advantages will clearly appear from the detailed description given below, taken in connection with the accompanying drawing which forms a part of this specification and illustrates, merely by way of example, one embodiment of the apparatus of the invention.

The invention consists in such novel features, arrangements and combinations of parts as may be shown and described in connection with the furnace arrangements herein disclosed, by way of example only, and as illustrative of a preferred embodiment, together with such novel methods and steps of processes as may also be described herein.

In the drawing the figure represents a plurality of drying or dewatering furnaces operatively associated with a calcining furnace according to the invention.

This application comprises a division of copending application Ser. No. 260,033, filed March 8, 1928, now Patent #1,852,646, Apr. 5, 1932, which application is more particularly directed to the features of construction of the drying or dewatering furnaces, two of which are here shown respectively in the drawing at the extreme right and at the left of the figure. It will be noted that these drying furnaces may comprise cylindrical enclosures containing a plurality of superposed hearths, a source of heat being provided at the base of the furnace. As to further details of construction and operation of the drying furnaces, reference is hereby made to said application.

Such drying furnaces are found to be particularly adaptable for use in conjunction with calcining and roasting furnaces to deliver dried material to the top drying hearth of such furnaces. Furthermore, when thus used, the heated air as discharged from the

air cooled rotatable shafts and rabble arms of such calcining furnaces may be readily used as a drying medium in the dehydrating furnaces merely by conducting such heated air or gases to the space beneath such furnaces. Also if desired, all of the outlet gases from the calcining or roasting furnaces may be passed through the drying furnace, for supplying the necessary heated air for carrying off the moisture. When thus coordinated with the operation of the calcining or roasting furnaces, these dehydrating furnaces are well adapted as dust collectors for the roasting furnace discharge gases. Inasmuch as the discharge gases gradually work their way up through the dehydrating furnaces, the dust will be accumulated by the wet material on the hearths and thus avoiding the use of special dust accumulating means. In roasting operations carried on in connection with certain ores, for example, flotation sulphide concentrates containing as much as twenty per cent. of water, the effective capacity of the roasting furnace can be substantially increased by first passing the wet material through one or more of the drying furnaces, and furthermore the drying will be accomplished substantially without permitting caking or excessive lumping of the material, which would tend to preclude thorough treatment during the roasting operation, particularly if conducted rapidly.

A group of the dehydrating furnaces may be conveniently arranged around the circular wall of a large calcining furnace, so that outlet gases from the calcining furnaces may be distributed between the dehydrating furnaces as desired. Such an arrangement is illustrated in the drawing, in which a calcining furnace is schematically indicated at 10, a drying furnace being indicated as at 11. Material carriers are indicated as at 12 for conveying the dried or dewatered material from the furnaces 11 to the calcining furnace. Conduits as at 13 serve to convey the gases discharged from the calcining furnace to the inlets 14 of the drying furnaces. If desired, heated gases from the central shaft of the calcining furnace, which have been used for cooling the shaft and rabble arms,

may be conveyed by conduits as at 15 to the base of the furnaces 11 as shown. Suitable damper regulating means may be provided in the conduits 13 and 15 as at 16 and 17 respectively. The calcined furnace may be of a type well-known in the art, such for example as is shown in numerous patents to Herreshoff, hence the details thereof need not be here described.

The above described arrangement may also be used in the preliminary treatment of fuller's earth which is to be revived, particularly where such earth is too oily to be conveniently treated in an ordinary roasting furnace without previous treatment. For such uses steam jets may be introduced into the drying furnace or furnaces, which furnaces may thus be used for reducing the oil content of the earth which may thereafter be more rapidly treated in the roasting furnace and with more accurate control of the roasting temperatures.

It will be understood of course that various forms of drying furnaces other than those above indicated may be used in connection with this invention as to certain of its phases.

While the invention has been described in detail with respect to a certain particular preferred example which gives satisfactory results it will be understood by those skilled in the art that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore to cover all such changes and modifications in the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In apparatus for drying and calcining materials in combination, a calcining furnace a plurality of drying furnaces positioned adjacent said calcining furnace, means for bringing a gas vent from the calcining furnace into communication with the hot air intake of each of the drying furnaces in an equivalent manner, whereby the heated gases discharged from the calcining furnace may be substantially uniformly divided between the drying furnaces for providing hot moisture absorbing gases therein, and means for feeding the material dried in the drying furnaces from the bases thereof to the top of the calcining furnace.

2. Drying and calcining apparatus comprising a drying furnace having a plurality of superposed hearths each having cavities for retaining quantities of sludge-like material rabbling means for advancing such material from each hearth to the next lower hearth, a calcining furnace comprising a unit separate and distinct from the drying furnace, means for conveying the dried material from beneath the lowermost hearth of the drying furnace to the top of the calcining furnace, and means for conveying preheated

gases from the top of the calcining furnace to the lower part of the drying furnace.

In testimony whereof I have signed my name to this specification.

EDITH MARY FOWLER, 70
(*Executrix of the last will and testament of Edward J. Fowler, Deceased.*)

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